

## REMARKS

Claims 1-2 and 4-20 are pending.

Claims 1-2 and 4-20 are rejected.

### **35 USC 103(a)**

**Claims 1-19 are rejected under 35 USC 103(a) as being unpatentable over Tansley et al in view of Fakoukakis, US 4956478 and further in view of Frohlich, US 5969011 and Sonoda, JP 62106091.**

Tansley discloses alkenyl succinic anhydride sizing agent for liquid packaging paper or board.

Examiner agrees that Tansley does not disclose the polymeric residues or olefinic content of the ASA. See page 6 of last Office Action.

Although Fakoukakis does not use ASA as a sizing agent, examiner believes ASA to be well known for such use and since Fakoukakis discloses a nearly pure ASA (99%), examiner believes it would be obvious to combine Tansley with Fakoukakis to arrive at the present invention.

Applicants respectfully submit a signed declaration which shows that sized paper with ASA of the presently claimed purity gives a sized paper showing unobvious advantages. In particular, the sized paper with ASA incorporating a maximum of 1% by weight polymeric residues and containing less than 5 % by weight of olefins give significantly improved Cobb ( $\text{g/m}^2$ ) values. The same improvement trend is seen in soft, standard and hard sizing.

Summary of the results presented in the declaration:

- Sizing evaluation was carried out using a solvent sizing procedure. Standard furnish (30% softwood and 70% hardwood) was used to prepare unsized paper samples. Acetone was used as solvent.
- Sizing efficiency increases (Cobb values decrease) when the olefin content is reduced to less than 5 % by weight of olefins. See table 4 and Fig. 1.
- Sizing efficiency increases (Cobb values decrease) when the polymeric residue content is reduced to less than 1 %. See table 5, Fig. 2.
- Tables 4 and 5 are run at standard sizing application rates (1000 mg/L). But the same trend is also observed in soft sizing (650 mg/L, table 1), and hard sizing (1400 mg/L, table 3).

- Inventor has addressed examiner's comments found on page 4, second paragraph of 01/22/2008 Office action concerning the insufficiency of the data in the specification to support broadly stated claims.
- Inventor has also addressed examiner's comments regarding the advantages of using a purified ASA.

Thus the declaration shows that paper or board sized with ASA incorporating a maximum of 1% by weight of polymeric residues and less than 5 % wt. of olefins show very significant Cobb value improvement. This improvement could not have been predicted from the combination of Tansley and Fakoukakis as Tansley does not disclose the polymeric residues or olefin content of ASA and Fakoukakis does not disclose the use of ASA for paper sizing. Neither reference suggests that such an advantage might be gained by using a sizing of low polymeric residues and olefinic content. Therefore, because the results are unobvious, the applicants believe the claims to also be unobvious in light of the cited references.

In regard to the examiner's comments found on page 4, second paragraph of 01/22/2008 Office action, the examiner believes the applicants to have failed to provide sufficient data in the specification to support broadly stated claims that embody a nonspecific paper or board of any weight made from any pulp, having any additives and any amount of ASA applied in the wet, end via size press or by any other method of application.

As the examiner is well aware, the inventor is entitled to more than what is exemplified. As explained by the declaration, one skilled in the art would not expect an ASA sizing of the claimed polymeric residue and olefin content to show a trend which differs from that shown in the declaration and specification when:

- the paper or board is characterized by a different pulp makeup,
- the paper or board is a different weight,
- the ASA is applied via size press, or
- when the concentration (amount) of ASA is varied.

The declaration shows that the concentration (and thus actual applied amount) of ASA is not especially important. The same trend (improved Cobb values) is seen regardless of whether the application concentration is 650 mg/L to 1400 mg/L.

Furthermore, as stated in the declaration the examples of the specification apply the ASA via wet end additions. See page 10, third paragraph. The declaration applies the ASA via solvent sizing in the wet end. Both solvent addition (declaration) and wet end addition with cationic starch (specification) show the same Cobb value trends. The specification suggests addition in the wet end, via size press or any other method application and there is no reason to expect the Cobb value trends to differ depending on the method of ASA application.

The important discovery or the heart of the invention is the effect of low polymeric residue and/or olefin content on Cobb values for sized paper or board. As mentioned in the declaration, one skilled in the art would not have purified ASA unless this advantage was known because of the increased cost. It is the present inventors who first discovered the advantage in sizing.

The applicants submit the claims are therefore unobvious in light of the new declaration and that the claims are commensurate in scope with the showing.

**35 USC 102(b) or 35 USC 103(a)**

Claim 10 is rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Tansley et al.

Claim 10 is a product-by-process claim. The Examiner alleges that the product of Tansley appears to be the same as or similar to the claimed product.

The applicants point to the recently submitted declaration. The declaration shows that the presently claimed sized paper or board is different and an improvement over the ASA sizing of Tansley. Tansley does not disclose polymeric residues or olefin content of his ASA. The declaration shows unambiguously the effect of low polymeric content and low olefin content on sized paper. Thus claim 10, although a product-by-process claim, contains limitations which distinguish from Tansley (low polymer residues) and is therefore novel. The claim is also unobvious as the low polymeric residues give an improved sized paper that could not be predicted based on Tansley.

### **Examiner's comments**

The examiner has consistently argued that it would be obvious to use a purified ASA for sizing. However, as explained in the declaration this does not make a lot of sense in that purified product would raise costs. These costs could only be rationalized if there were significant advantages in using such a product. It is the present inventors which have discovered the particular sizing advantages for the use of low polymeric residue and olefinic content in ASA. So the motivation to combine Tansley with the more purified product of Fakoukakis for paper sizing would simply not exist unless one was aware of advantages. Clearly neither Tansley nor Fakoukakis envisions these advantages.

Furthermore, the examiner relies on Sonada to teach a high purity product for information recording material (which the examiner construes to encompass recording papers). However, the applicants believe Sonada's reference to information recording material means magnetic recording material. Magnetic recording material does not use paper as a substrate but uses plastic film. The applicants refer the examiner to US 5118565 wherein ASA is used as a lubricant for the magnetic material on a plastic substrate. See column 1 of US 5118565, lines 10-15.

When Sonada says that ASA containing tar and high molecular weight polymer is used for regular purposes such as sizing agent, Sonada is conveying the conventional wisdom. Sonada says that high purity product is required for information recording material (or magnetic recording material). Thus Sonada is not recommending a purified ASA for sizing but a purified ASA for magnetic recording material.

Additionally in scanning Table 1 on page 7 of the English translation of Sonada, the formed ASA contains a minimum of 2.2 % polymer residues. This is far outside the present claim limitations of a maximum of 1 % polymeric residues. Thus even if one were to take the product formed in Sonada and use in the process of Tansely, one would not arrive at the presently claimed invention.

Reconsideration and withdrawal of the rejection of claims 1-2 and 3-20 is respectfully solicited in light of the remarks *supra* and submitted declaration.

Since there are no other grounds of objection or rejection, passage of this application to issue with claims 1-2 and 4-20 is earnestly solicited.

Applicants submit that the present application is in condition for allowance. In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

Respectfully submitted,



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Enclosure: 1.132 Declaration.